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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,496	08/26/2003	Boris Glezer	03-127	5875
719	7590	01/24/2005	EXAMINER	
CATERPILLAR INC. 100 N.E. ADAMS STREET PATENT DEPT. PEORIA, IL 616296490			KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3746	

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,496

Applicant(s)

GLEZER ET AL.

Examiner

Ted Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/06/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 3, 11 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-10, 12-20, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/26/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 3, 11, 21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/06/2004.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of claim 16 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing

figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 9, 10, 16, 18-20, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Waeselynck (3,773,462) teaches a gas turbine combustor, comprising: a combustion zone; a first liner bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector; and a plurality of passages between vanes 8 positioned between said first liner and said first convector, at least one of said passages having a length that is greater than at least one of said defined distance of said first liner and said defined distance of said first convector; said plurality of passages between 8 are spiral passages; at least one of said first liner and said first convector having a central axis; a fluid disposed between said

first liner and said first convector; and means for causing said fluid to move in a direction nonparallel to said central axis; the engine includes a serial cooling system 7.

5. Claims 18-20, 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Schirmer (3,939,653). Schirmer teaches the method and apparatus including first liner 12, first convector 33, means for causing said fluid to move in a direction nonparallel to said central axis comprising spiral passages between 40, 42 and non-parallel fluid movement.

6. Claims 1, 2, 9, 10, 16, 18-20, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Shekleton (5,187,932). Shekleton teaches a gas turbine combustor, comprising: a combustion zone; a first liner 14 bounding said combustion zone 20, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 26 spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone 20 and said first convector; and a plurality of passages between helical strips 48 positioned between said first liner and said first convector, at least one of said passages having a length that is greater than at least one of said defined distance of said first liner and said defined distance of said first convector; said plurality of passages are spiral passages between 48; at least one of said first liner and said first convector having a central axis; a fluid disposed between said first liner and said first convector; and means

for causing said fluid to move in a direction nonparallel to said central axis; the engine includes a serial cooling system for e.g. cooling at 22 or 28 or to the right of 28.

7. Claims 1, 2, 5, 8-10, 13, 16-20, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Liebe (6,341,485). Liebe teaches a gas turbine combustor, comprising: a combustion zone 32; a first liner 6 bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector³ spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector; and a plurality of passages 13, 14, and/or 24 between 49 positioned between said first liner and said first convector, at least one of said passages having a length that is greater than at least one of said defined distance of said first liner and said defined distance of said first convector; said plurality of passages are spiral passages 24 between 49; wherein at least one of said plurality of passages includes at least one cooling device 15 positioned therein; at least one of said first liner and said first convector having a central axis; a fluid disposed between said first liner and said first convector; and means for causing said fluid to move in a direction nonparallel (either 24 or when the flow is undergoing flow reversal from 11a to 11b, see e.g. Fig. 2) to said central axis; the engine includes a serial cooling system for cooling 21. As for the second liner and second convector, Liebe show an annular combustor arrangement in Figs. 6 and

7 where the outer/first liner/first convector 52 and inner/second liner/second convector have a configuration as in Fig. 1.

8. Claims 1, 2, 5, 9, 10, 13, 16, 18-20, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Farlow (2,221,185). Farlow teaches a gas turbine (col. 1, lines 1-6) combustor, comprising: a combustion zone 12; a first liner 11 bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 10 spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector; and a plurality of passages positioned between said first liner and said first convector between 76, at least one of said passages having a length that is greater than at least one of said defined distance of said first liner and said defined distance of said first convector; said plurality of passages are spiral passages; there are three passages; wherein at least one of said plurality of passages includes at least one cooling device 73 positioned therein; at least one of said first liner and said first convector having a central axis; a fluid disposed between said first liner and said first convector; and means for causing said fluid to move in a direction nonparallel to said central axis; the engine includes a serial cooling system.

9. Claims 1, 2, 9, 10, 16, 18-20, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ross (2,728,192). Ross teaches a gas turbine combustor, comprising: a

combustion zone F; a first liner 2 bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 11 spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector; and a plurality of passages 12 positioned between said first liner and said first convector, at least one of said passages having a length that is greater than at least one of said defined distance of said first liner and said defined distance of said first convector; said plurality of passages are spiral passages; there are three passages; a fluid disposed between said first liner and said first convector; and means for causing said fluid to move in a direction nonparallel to said central axis; the engine includes a serial cooling system

10. Claims 1, 2, 5, 7, 9, 10, 13, 15, 16, 18-20, 22, 23 are rejected under 35

U.S.C. 102(b) as being anticipated by JP 10-82527. JP '527 teaches a gas turbine combustor, comprising: a combustion zone 16; a first liner 17 bounding said combustion zone, said first liner having a first end portion and a second end portion spaced a defined distance from said first end portion; a first convector 21 spaced apart from said first liner, said first convector having a first end portion and a second end portion spaced a defined distance from said first end portion, said first liner being disposed between said combustion zone and said first convector; and a plurality of passages between 37 (see Fig. 12) positioned between said first liner and said first convector, at least one of said passages having a length that is greater than at least one of said defined distance of said

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first liner and said defined distance of said first convector; said plurality of passages are spiral passages; wherein at least one of said plurality of passages includes at least one cooling device 29 positioned therein; including a trip strip 29; at least one of said first liner and said first convector having a central axis; a fluid disposed between said first liner and said first convector; and means for causing said fluid to move in a direction nonparallel to said central axis; the engine includes a serial cooling system from 26.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 5-7, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above prior art in view of either Glezer et al (6,098,397) or JP 10-82527. The prior art teach various aspects of the invention and some do not address further cooling devices. Glezer teach cooling devices/dimples 84 as being effective for enhancing combustor cooling. JP '527 teach trip strips are effective for enhancing combustor cooling. It would have been obvious to one of ordinary skill in the art to employ further cooling devices to enhance combustor cooling.

13. Claim 4, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above prior art in view of the ordinary skill in the art. The prior art do not teach the

number of helical passages being 3. However, finding the number of passages is regarded as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ 3 helical passages, as being an obvious matter of using the workable ranges in the art.

14. Claims 8, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of JP 10-82527, Farlow (2,221,185) and Waeselynck (3,773,462) in view of Liebe (6,341,485). The above prior art do not teach a second liner and second convector, i.e. an annular combustor arrangement. Liebe teaches spiral cooling channels in a cylindrical combustor (Fig. 1) and an annular combustor (Figs. 6, 7) have similar arrangements for the first liner/convector and the second liner/convector. It would have been obvious to one of ordinary skill in the art to apply the spiral cooling channels of the prior art in an annular combustor and thus have both similar first liner/convector and the second liner/convector, as taught by Liebe, in order to utilize a well known combustor cooling technique to annular combustors.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The


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Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler, can be reached on 571-272-4834.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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Patents Assistance Center	Telephone	800-786-9199